



# OSPF NSR

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The OSPF NSR feature allows a router with redundant Route Processors (RPs) to maintain its Open Shortest Path First (OSPF) state and adjacencies across planned and unplanned RP switchovers. It does this by checkpointing state information from OSPF on the active RP to the standby RP. Later, following a switchover to the standby RP, OSPF can use this checkpointed information to continue operation without interruption.

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## Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the Feature Information Table at the end of this document.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to [www.cisco.com/go/cfn](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

## Prerequisites for OSPF NSR

- OSPF NSR is available for platforms with redundant RPs or Cisco IOS software redundancy running Cisco IOS Release XE 3.3S or later releases.



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## Restrictions for OSPF NSR

- OSPF nonstop routing (NSR) can significantly increase the memory used by OSPF during certain phases of its operation. CPU usage also can be increased. You should be aware of router memory capacity and estimate the likely memory requirements of OSPF NSR. For more information see [Configuring OSPF NSR](#). For routers where memory and CPU are constrained you might want to consider using OSPF NSF instead. For more information, see OSPF RFC 3623 Graceful Restart Helper Mode.
- A switchover from the active to the standby RP can take several seconds, depending on the hardware platform, and during this time OSPF is unable to send Hello packets. As a result, configurations that use small OSPF dead intervals might not be able to maintain adjacencies across a switchover.

## Information About OSPF NSR

- [OSPF NSR Functionality, page 2](#)

## OSPF NSR Functionality

Although OSPF NSR serves a similar function to OSPF NSF, it works differently. With NSF, OSPF on the newly active standby RP initially has no state information, so it uses extensions to the OSPF protocol to recover its state from neighboring OSPF routers. For this to work, the neighbors must support the NSF protocol extensions and be willing to act as "helpers" to the restarting router. They must also continue forwarding data traffic to the restarting router while this recovery is taking place.

With NSR, by contrast, the router performing the switchover preserves its state internally, and in most cases the neighbors are unaware that anything has happened. Because no assistance is needed from neighboring routers, NSR can be used in situations where NSF cannot; for example, in networks where not all the neighbors implement the NSF protocol extensions, or where network topology changes during the recovery can make NSF unreliable.

## How to Configure OSPF NSR

- [Configuring OSPF NSR, page 2](#)

## Configuring OSPF NSR

Perform this task to configure OSPF NSR.

NSR adds a single new line, "nsr," to the OSPF router mode configuration. Routers that do not support NSR, for whatever reason, will not accept this command.



Note

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**SUMMARY STEPS**

1. **enable**
2. **configure terminal**
3. **router ospf *process-id***
4. **n sr**
5. **end**
6. **show ip ospf [ *process-id* ] nsr [[ *objects* ]][ *statistics* ]**

**DETAILED STEPS**

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>configure terminal</b>  <b>Example:</b> Router# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>router ospf <i>process-id</i></b>  <b>Example:</b> Router(config)# router ospf 109	Places the router in router configuration mode and configures an OSPF routing process.
<b>Step 4</b>	<b>n sr</b>  <b>Example:</b> Router(config-router)# nsr	Configures NSR.
<b>Step 5</b>	<b>end</b>  <b>Example:</b> Router(config-router)# end	Exits router configuration mode and returns to privileged EXEC mode.

Command or Action	Purpose
<b>Step 6</b> <code>show ip ospf [ process-id ] nsr [[ objects ]][ statistics ]]</code>	Displays OSPF NSR status information.
<b>Example:</b>  Router# <code>show ip ospf 109 nsr</code>	

- [Troubleshooting Tips, page 4](#)

## Troubleshooting Tips

OSPF NSR can increase the amount of memory used by the OSPF router process. To determine how much memory OSPF is currently using without NSR you can use the **show processes** and **show processes memory** commands:

```
Router# show processes
| include OSPF
276 Mwe 133BE14          1900      1792      1060 8904/12000  0 OSPF-1 Router
296 Mwe 133A824           10        971       10 8640/12000  0 OSPF-1 Hello
```

Process 276 is the OSPF router process that is to be checked. The **show processes memory** command is used to display its current memory use:

```
Router# show processes memory 276
Process ID: 276
Process Name: OSPF-1 Router
Total Memory Held: 4454800 bytes
```

In this case OSPF is using 4,454,800 bytes or approximately 4.5 megabytes (MB). OSPF NSR could double this for brief periods, so you should make sure the router has at least 5 MB of free memory before enabling OSPF NSR.

## Configuration Examples for OSPF NSR

- [Example Configuring OSPF NSR, page 4](#)

### Example Configuring OSPF NSR

The following example shows how to configure OSPF NSR:

```
router> enable
Router# configure terminal
Router(config)# router ospf 1
Router(config-router)# nsr
Router(config-router)# end
Router# show ip ospf 1 nsr
Standby RP
Operating in duplex mode
Redundancy state: STANDBY HOT
Peer redundancy state: ACTIVE
ISSU negotiation complete
ISSU versions compatible
Routing Process "ospf 1" with ID 10.1.1.100
```

```

NSR configured
Checkpoint message sequence number: 3290
Standby synchronization state: synchronized
Bulk sync operations: 1
Last sync start time: 15:22:48.971 UTC Fri Jan 14 2011
Last sync finish time: 15:22:48.971 UTC Fri Jan 14 2011
Last sync lost time: -
Last sync reset time: -
LSA Count: 2, Checksum Sum 0x00008AB4

```

The output shows that OSPF NSR is configured and that OSPF on the standby RP is fully synchronized and ready to continue operation should the active RP fail or if a manual switchover is performed.

## Additional References

### Related Documents

Related Topic	Document Title
Cisco IOS commands	<a href="#">Cisco IOS Master Commands List, All Releases</a>
OSPF commands	<i>Cisco IOS IP Routing: OSPF Command Reference</i>
Configuring IETF NSF or Cisco NSF	NSF--OSPF (RFC 3623 OSPF Graceful Restart)

### Standards

Standard	Title
None	--

### MIBs

MIB	MIBs Link
None	To locate and download MIBs for selected platforms, Cisco software releases, and feature sets, use Cisco MIB Locator found at the following URL: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

### RFCs

RFC	Title
RFC 2328	<i>OSPF Version 2</i>

**Technical Assistance**

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	<a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a>

## Feature Information for OSPF NSR

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

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**Table 1**      *Feature Information for OSPF NSR*

Feature Name	Releases	Feature Information
OSPF NSR	XE 3.3S	<p>The OSPF NSR feature allows a router with redundant route processors to maintain its OSPF state and adjacencies across planned and unplanned RP switchovers.</p> <p>In Cisco IOS Release XE 3.3S, this feature was introduced.</p> <p>The following commands were introduced or modified: <b>nsr</b>, <b>show ip ospf nsr</b>.</p>

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